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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,475	03/05/2004	Singaravelu Elangovan	CER-041113	2474
55162	7590	06/27/2006	EXAMINER	
CERAMATEC, INC. 2425 SOUTH 900 WEST SALT LAKE CITY, UT 84119			KOPEC, MARK T	
			ART UNIT	PAPER NUMBER
			1751	

DATE MAILED: 06/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/708,475	Applicant(s) ELANGO VAN ET AL.	
	Examiner Mark Kopec	Art Unit 1751	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
 4a) Of the above claim(s) 16-19 and 21-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15,20 and 27-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/5/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

This application contains claims directed to the following patentably distinct species:

I) proton-conducting perovskite(s) of the formula $A_{1-x-g}P_xB_{1-y}Q_yO_{3-g'}$ (claim 11)

II) proton-conducting perovskite(s) of the formula $(A'_{2-y}A''_y)_2(B_{2-n}R_n)O_{t-g}$ (claim 16),

III) proton-conducting perovskite(s) of the formula $A_2(B'_{1+b}B''_{1-b})O_{6-g}$ (claim 21),

IV) proton-conducting perovskite(s) of the formula $A_3(B'_{1+b}B''_{2-g})O_{9-g'}$ (claim 24).

The species are independent or distinct as each is directed to a separately patentable family of proton-conductive phase.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held

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to be allowable. Currently, claims 1-10, 20 and 27-29 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

During a telephone conversation with Mr. David Fonda on 06/14/06 a provisional election was made with traverse to prosecute the invention of Species I, claims 11-15 (and generic 1-10, 20 and 27-29). Affirmation of this election must be made by applicant in replying to this Office action. Claims 16-19, 21-26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 4-7, and 11-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "...substantially structurally and chemically identical" in claim 2 is a relative term which renders the claim indefinite. The term is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

In claims 4-7 and 11-15, applicant should amend the current claim language "represents one of" and "selected from the group

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consisting essentially of" to proper Markush form --selected from the group consisting of--. Also, claims 4, 5, and 11 should recite ranges for all required variable subscripts.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-9, 11-15, 20 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuenstler et al (Physical-chemical investigations...).

Note that a full English language copy of this reference has been ordered and will be provided to applicant as soon as possible.

Kuenstler discloses the system BaCe_{1-x}Me_xO₃-<SYM97> (Me = Gd, Eu, In) was prepared in a concentration range 0.05 <SYM163> x <SYM163> 0.25 mol and the phys.-chemical properties ascertained. The doped barium cerates correspond with the

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structure of the BaCeO₃ with a small amount of CeO₂. The compds. are stable in reducing and oxidizing atmospheric and have a high solubility of oxygen. The doped BaCeO₃ indicate a point defect behavior in the oxygen partial pressure range 1-10⁻⁶ bar. The maximum of the total elec. conductivity was found at a content of 0.15 mol for GdO_{1.5}, InO_{1.5} and 0.10 mol for EuO_{1.5}. The elec. conductivity of Gd-, Eu-doped BaCeO₃ exceeds the conductivity of 17% yttria-stabilized zirconia (Y17SZ). The mean ionic transport number is $t_{ion} = 1$ in hydrogen above 700°C whereas in argon a deviation from 1 is observed. A small deviation from 1 is detected also for Eu- and In-doped BaCeO₃ under hydrogen at 850 °C. Our investigations cover the temperature range 700-1000 °C (Abstract). The disclosed combination of BaCe_{1-x}Eu_xO_{3-y} and CeO₂ specifically or inherently meets each of the claimed limitations.

The reference is anticipatory.

Claims 1-15, 20 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Balachandran et al (Solid State Ionics).

Balachandran discloses mixed-conducting oxides used in applications such as fuel cells, gas-separation membranes, sensors and electrocatalysis (Abstract). Specifically disclosed are proton-conductors BaCe_{0.95}Y_{0.05}O₃ (page 364 Experimental and page 366 Section 3.2). The conductivity of the material in

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argon and water vapor is disclosed (Fig 5). Although the reference does not disclose the presence of an "electron conducting phase" (i.e. cerium oxide), such would inherently form as a reaction product between the $\text{BaCe}_{0.95}\text{Y}_{0.05}\text{O}_3$ and H_2O . See instant specification para 0024. The reference specifically or inherently meets each of the claimed limitations.

The reference is anticipatory.

Claims 1-15, 20 and 27-29 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wallin (5,670,270).

Wallin discloses a composite oxygen electrode/electrolyte structure for a solid state electrochemical device having a porous composite electrode in contact with a dense electrolyte membrane, which electrode includes: (a) a porous structure having interpenetrating networks of an ionically-conductive material and an electronically-conductive material; and (b) an electrocatalyst different from the electronically-conductive material, dispersed within the pores of the porous structure (Abstract). Suitable electronically-conductive materials and electrocatalysts include metallic or semi-conductive materials such as metals, conductive metal alloys, conductive metal oxides, and mixtures thereof. Examples of suitable metals include platinum, silver, palladium, rhodium, iridium and

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ruthenium. Examples of suitable conductive metal alloys include conductive metal oxides such as the rare earth perovskites having the general formula: $A_{1-a}A'_a B_{1-b} B'_b O_{3-\delta}$, where $0 \leq a \leq 1$; $0 \leq b \leq 1$; $-0.2 \leq \delta \leq 0.5$; A is at least one rare earth cation such as La, Pt, Nd, Sm or Tb; A' is at least one dopant cation, such as the alkaline earth cations Sr or Ca; B is at least one transition element cation selected from the group consisting of Mn, Co, Fe, Cr, or Ni; and B' is a transition element cation different from B. Examples of other conductive metal oxides include the products formed from mixtures of In_2O_3 -- $PrO_{1.83}$ -- ZrO_2 , having composition ratios of In_2O_3 of 0 to 90%, $PrO_{1.83}$ of 10 to 100%, ZrO_2 of 0 to 50% and the products formed from mixtures of Co_3O_4 -- $PrO_{1.83}$ -- ZrO_2 , having composition ratios of Co_3O_4 of 0 to 70%, $PrO_{1.83}$ of 30 to 100% and ZrO_2 of 0 to 50%. Other conductive or semi-conductive materials having a conductivity of at least 0.1 S/cm at the cell operating temperature may also be useful. (Col 3, line 57 to Col 4, line 19). Suitable ionically-conductive materials include strontium-doped $BaCeO_3$ (Col 4, lines 40-45). The reference also teaches the presence of additional conductive materials such as Ag (Col 5, lines 55-66). The reference specifically or inherently meets each of the claimed limitations.

The reference is anticipatory.

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In the event that any minor modifications are necessary to meet the claimed limitations, such as selection of a particular Lanthanide series element or second electron conducting phase, such modifications are well within the purview of the skilled artisan.

In view of the foregoing, the above claims have failed to patentably distinguish over the applied art.

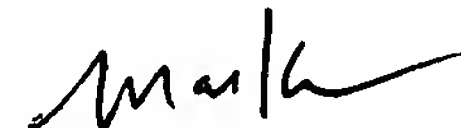
The remaining references listed on forms 892 and 1449 have been reviewed by the examiner and are considered to be cumulative to or less material than the prior art references relied upon in the rejection above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Kopec whose telephone number is (571) 272-1319. The examiner can normally be reached on Monday - Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas McGinty can be reached on (571) 272-1029. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Mark Kopec
Primary Examiner
Art Unit 1751

MK

June 20, 2006